BROADCAST RECEIVER PROVIDED WITH RECEPTION CHANNEL NUMBER DISPLAY FUNCTION

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Inventor(s): INUI YASUHIRO; TANI KAZUHIKO; ISHIHARA KAZUHIDE; KATAYAMA TAKAHIRO +
Applicant(s): FUNAI ELECTRIC CO +
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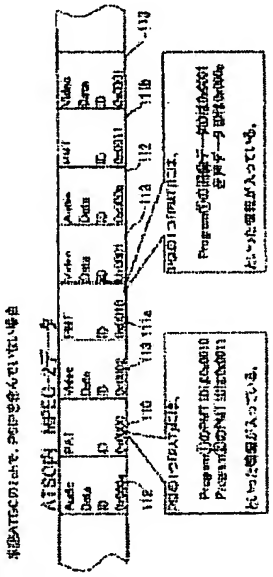
Abstract of **JP 2002344838 (A)**

PROBLEM TO BE SOLVED: To assign a virtual channel number to a user for convenience and to display it in OSD even if a PSIP is obtained in a broadcast receiver provided with a reception channel number display function. SOLUTION: A physical channel number is assigned to a virtual main channel number for convenience. Assignment is performed to a virtual sub-channel number for convenience in response to the order of ID numbers of PMT 111a which is obtained by analyzing PAT 110 contained in MPEG-2 data. The virtual channel numbers are displayed in OSD in a form which is different from that of the virtual channel number obtained by analyzing PSIP.



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(71)出願人　000201113
船井電機株式会社
大阪府大東市中垣内７丁目７番１号
(72)発明者　乾　泰寛
大阪府大東市中垣内７丁目７番１号　船井電機株式会社内
(72)発明者　谷　和彦
大阪府大東市中垣内７丁目７番１号　船井電機株式会社内
(74)代理人　100084375
弁理士　板谷　康夫

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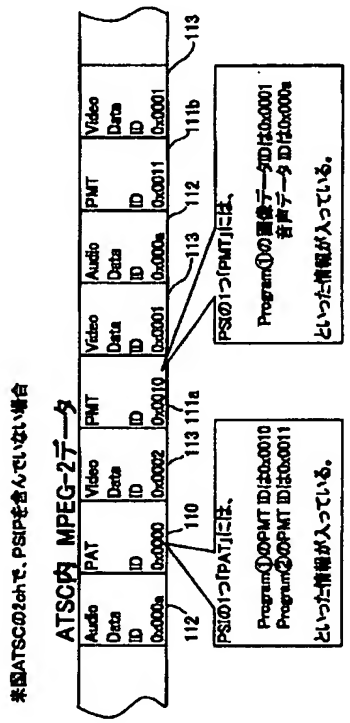
(54)【発明の名称】　受信チャンネル番号表示機能を有する放送受信装置

(57)【要約】
【課題】　受信チャンネル番号表示機能を有する放送受信装置において、ＰＳＩＰを取得できなかったときであっても、ユーザにとって便宜上の仮想チャンネル番号を割り当ててＯＳＤ表示する。
【解決手段】　便宜上の仮想メインチャンネル番号には、物理チャンネル番号を割り当てる。便宜上の仮想サブチャンネル番号は、ＭＰＥＧ-2データに含まれるＰＡＴ 110を解析して取得したＰＭＴ 111aのID番号の順番に従って割り当てる。これらの便宜上の仮想チャンネル番号をＰＳＩＰを解析した取得した仮想チャンネル番号とは異なる形態でＯＳＤ表示する。



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【特許請求の範囲】

【請求項１】　装置本体にチャンネル変更指令を入力するための入力手段と、放送局からＡＴＳＣ（Advanced Television Systems Committee）の規格に準拠させてＭＰＥＧ（Moving Picture Experts Group）-2の情報パケットにＰＳＩＰ（Program and System Information Protocol）の情報パケットを付加した上で発信されるデジタル／アナログ放送信号を受信する受信手段と、前記受信手段により受信したデジタル放送信号から映像信号、音声信号及び制御信号を抽出する信号抽出手段と、前記信号抽出手段によって抽出された映像信号又はアナログ放送信号に含まれる映像信号を復号して、その復号信号を本装置に接続された映像を表示する表示手段に出力するデジタル／アナログ復号手段と、前記信号抽出手段によって抽出された制御信号を記憶する記憶手段と、前記表示手段に所定のオンスクリーンディスプレイ（以下、ＯＳＤと記す）表示をさせるＯＳＤ出力手段と、上記装置の各手段を制御する制御手段とを備え、受信チャンネル番号を前記表示手段よりＯＳＤ表示する受信チャンネル番号表示機能を有する放送受信装置において、

同一又は同一系統の放送局からデジタル放送信号とアナログ放送信号とが互いに異なる物理チャンネルにより発信され、デジタル放送信号は、前記物理チャンネルごとに発信され、１つの物理チャンネルにつき１又は複数のコンテンツを発信するためのサブチャンネルを含み、かつ、このサブチャンネルに前記アナログ放送の物理チャンネル番号と同一の番号及びサブチャンネル番号からなる仮想チャンネル番号が付与されており、

前記制御手段は、

前記信号抽出手段が抽出した制御信号の中から前記ＰＳＩＰの情報パケットを取得し、それを解析して得られたＶＣＴ（Virtual Channel Table）を参照することにより、受信する仮想チャンネル番号を特定し、この仮想チャンネル番号のＯＳＤ表示を行い、

前記制御信号の中からＰＳＩＰを取得できなかったときは前記ＭＰＥＧ-2の情報パケットを取得し、その中に含まれるＰＡＴ（Program Association Table）及びＰＭＴ（Program Map Table）を解析して検出した各サブチャンネルの順番に従って各サブチャンネルに便宜上の仮想サブチャンネル番号を割り当て、前記物理チャンネル番号と、前記便宜上の仮想サブチャンネル番号とからなるチャンネル番号を便宜上の仮想チャンネル番号として、前記ＶＣＴを解析することにより特定した仮想チャンネル番号とは相異なる形態のＯＳＤ表示を行うことを特徴とする受信チャンネル番号表示機能を有する放送受信装置。

【請求項２】　装置本体にチャンネル変更指令を入力するための入力手段と、放送局からＡＴＳＣ（Advanced Television Systems Committee）の規格に準拠させてＭＰＥＧ（Moving Picture Experts Group）-2の情報パケットにＰＳＩＰ（Program and System Information Protocol）の情報パケットを付加した上で発信されるデジタル放送信号を受信する受信手段と、前記受信手段により受信したデジタル放送信号から映像信号、音声信号及び制御信号を抽出する信号抽出手段と、前記信号抽出手段によって抽出された映像信号又はアナログ放送信号に含まれる映像信号を復号して、その復号信号を本装置に接続された映像を表示する表示手段に出力するデジタル復号手段と、前記信号抽出手段によって抽出された制御信号を記憶する記憶手段と、前記表示手段に所定のオンスクリーンディスプレイ（以下、ＯＳＤと記す）表示をさせるＯＳＤ出力手段と、上記装置の各手段を制御する制御手段とを備え、受信チャンネル番号を前記表示手段よりＯＳＤ表示する受信チャンネル番号表示機能を有する放送受信装置において、

同一又は同一系統の放送局からデジタル放送信号とアナログ放送信号とが互いに異なる物理チャンネルにより発信され、デジタル放送信号は、前記物理チャンネルごとに発信され、１つの物理チャンネルにつき１又は複数のコンテンツを発信するためのサブチャンネルを含み、かつ、このサブチャンネルに前記アナログ放送の物理チャンネル番号と同一の番号とサブチャンネル番号とからなる仮想チャンネル番号が付与されており、

前記制御手段は、前記制御信号の中から前記ＭＰＥＧ-2の情報パケットを取得し、その中に含まれるＰＳＩ（Program Specific Information）を解析して検出した各サブチャンネルの順番に従って各サブチャンネルに便宜上の仮想サブチャンネル番号を割り当て、前記物理チャンネル番号と、前記便宜上の仮想サブチャンネル番号とからなるチャンネル番号を便宜上の仮想チャンネル番号として、ＯＳＤ表示を行うことを特徴とする受信チャンネル番号表示機能を有する放送受信装置。

【請求項３】　前記制御手段は、前記信号抽出手段が抽出した制御信号に含まれるＰＳＩＰ（Program and System Information Protocol）を取得したときは、該ＰＳＩＰを解析して得られたＶＣＴ（Virtual Channel Table）を参照することにより、受信する仮想チャンネル番号を特定し、該仮想チャンネル番号をＯＳＤ表示することを特徴とする請求項２に記載の受信チャンネル番号表示機能を有する放送受信装置。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明は、放送受信装置に係り、特に受信する仮想チャンネル番号を表示手段にＯＳＤ表示させる受信チャンネル番号表示機能を有するデジタル放送受信装置に関するものである。

【０００２】

【従来の技術】従来より、ケーブルデジタル放送等において、ＭＰＥＧ-2規格で圧縮・符号化した映像及び音声信号をＣＡＴＶ伝送路を介して発信する際に用いられる

変調器として６４ＱＡＭ変調器が知られている（例えば、特開２０００－１９７０２０号公報参照）。これは、ユーザ（受信者）側の放送受信装置にチャンネル番号を表示させて、放送受信中に障害が発生したときに、上記表示させたチャンネル番号からいずれの６４ＱＡＭ変調器で障害が発生したかを特定可能とするものである。この変調器は、放送局側が放送信号の発信の際に使用される。また、視聴可能なチャンネルのみを表示画面に出力して、ユーザのチャンネル選択操作を容易にしたデジタル放送受信装置が知られている（例えば、特開平１０－２００８６８号公報参照）。

【０００３】ところで、北米においては、近年、放送局からＡＴＳＣ（Advanced Television Systems Committee）に準拠するデジタル放送が配信されている。このデジタル放送を受信して、既存のＮＴＳＣ（National Television Systems Committee）のアナログ放送対応のテレビジョン受像機が受像可能な信号に変換するための放送受信装置（セットトップボックス：以下ＳＴＢと記す）が普及しつつある。このＳＴＢに特開平１０－２００８６８号公報に開示された機能を持たせることは可能である。

【０００４】ＡＴＳＣのデジタル放送では、アナログ放送信号とは異なる物理チャンネルによりデジタル放送信号が発信されている。１つの物理チャンネルは、１又は複数のコンテンツを発信するためのサブチャンネルを含み、このサブチャンネルには、同一又は同一系統の放送局から発信されるアナログ放送の物理チャンネル番号と同一の番号（メインチャンネル番号）及びサブチャンネル番号からなる仮想チャンネル番号が付与されている。従って、仮想チャンネルは、メインチャンネルとサブチャンネルとにより階層的に構成されている。

【０００５】デジタル放送の放送信号は、映像信号、音声信号及び制御信号からなり、ＡＴＳＣのデジタル放送では、上記制御信号に仮想チャンネル番号や放送局名に関する情報を含んだＰＳＩＰ（Program and System Information Protocol）を添付して発信されるように義務付けられている。ＳＴＢの制御部は、このＰＳＩＰを取得・解析して得られたＶＣＴ（Virtual Channel Table）を参照することにより、受信する仮想チャンネル番号を特定できる。デジタル放送では、既に述べたように、各チャンネルはメインチャンネル番号とサブチャンネル番号とにより階層的に構成されており、その構成は複雑であるため、ユーザは自らが選択したチャンネルの構成を理解できない場合がある。そこで、ＳＴＢは、上記特定した仮想チャンネル番号を表示装置にＯＳＤ表示して、ユーザの使い勝手の向上を図っている。

【０００６】

【発明が解決しようとする課題】しかしながら、放送局によっては、ＰＳＩＰを制御信号として添付せずにデジタル放送信号を発信している局も存在し、このような放送局のチャンネルを受信した場合は、ＰＳＩＰを取得することができない。また、放送局がＰＳＩＰを添付して放送信号を発信していても、例えばＰＳＩＰの信号に不正なＰＳＩＰデータが付加された等の何らかの事情により、ＰＳＩＰの取得に失敗する場合もある。このようにＰＳＩＰを取得できない場合は、映像信号を取得し受像することは可能であっても、その仮想チャンネル番号は不明であるためそのＯＳＤ表示を行うことができず、ユーザの使い勝手が良くない。

【０００７】本発明は、上述した問題点を解決するためになされたものであり、デジタル放送受信装置において、放送信号に含まれるＰＳＩＰを取得できなかった場合においても、ユーザにとって便宜上のチャンネル番号を表示することにより、チャンネル変更を容易なものとして使い勝手の向上を図った受信チャンネル番号の表示機能を有する放送受信装置を提供することを目的とする。

【０００８】

【課題を解決するための手段】上記目的を達成するために請求項１の発明は、装置本体にチャンネル変更指令を入力するための入力手段と、放送局からＡＴＳＣ（Advanced Television Systems Committee）の規格に準拠させてＭＰＥＧ（Moving Picture Experts Group）-2の情報パケットにＰＳＩＰ（Program and System Information Protocol）の情報パケットを付加した上で発信されるデジタル／アナログ放送信号を受信する受信手段と、受信手段により受信したデジタル放送信号から映像信号、音声信号及び制御信号を抽出する信号抽出手段と、信号抽出手段によって抽出された映像信号又はアナログ放送信号に含まれる映像信号を復号して、その復号信号を本装置に接続された映像を表示する表示手段に出力するデジタル／アナログ復号手段と、信号抽出手段によって抽出された制御信号を記憶する記憶手段と、表示手段に所定のオンスクリーンディスプレイ（以下、ＯＳＤと記す）表示をさせるＯＳＤ出力手段と、上記装置の各手段を制御する制御手段とを備え、受信チャンネル番号を表示手段よりＯＳＤ表示する受信チャンネル番号表示機能を有する放送受信装置において、同一又は同一系統の放送局からデジタル放送信号とアナログ放送信号とが互いに異なる物理チャンネルにより発信され、デジタル放送信号は、物理チャンネルごとに発信され、１つの物理チャンネルにつき１又は複数のコンテンツを発信するためのサブチャンネルを含み、かつ、このサブチャンネルにアナログ放送の物理チャンネル番号と同一の番号及びサブチャンネル番号からなる仮想チャンネル番号が付与されており、制御手段は、信号抽出手段が抽出した制御信号の中からＰＳＩＰの情報パケットを取得し、それを解析して得られたＶＣＴ（Virtual Channel Table）を参照することにより、受信する仮想チャンネル番号を特定し、この仮想チャンネル番号のＯＳＤ表示を行い、制

御信号の中からＰＳＩＰを取得できなかったときはＭＰＥＧ-2の情報パケットを取得し、その中に含まれるＰＡＴ（Program Association Table）及びＰＭＴ（Program Map Table）を解析して検出した各サブチャンネルの順番に従って各サブチャンネルに便宜上の仮想サブチャンネル番号を割り当て、物理チャンネル番号と、便宜上の仮想サブチャンネル番号とからなるチャンネル番号を便宜上の仮想チャンネル番号として、ＶＣＴを解析することにより特定した仮想チャンネル番号とは相異なる形態のＯＳＤ表示を行うものである。

【０００９】この構成においては、デジタル放送信号は、映像信号、音声信号及び制御信号を含み、ＭＰＥＧ-2規格により動画圧縮されパケット化されたデータ（ＭＰＥＧ-2データ）で放送局から発信される。制御信号には、ＡＴＳＣ放送を受信するための仮想チャンネルに関する情報を有するＰＳＩＰの情報パケットが付加される。ＭＰＥＧ-2の情報パケットには、番組の構成に関する情報を有するＰＳＩ（Program Specific Information）等が含まれる。ＡＴＳＣでは、ＰＳＩＰをデジタル放送信号に添付して発信するように義務付けられているが、放送局によっては必ずしもこれが添付された状態で発信されるとは限られない。一方、ＰＳＩは、映像信号及び音声信号を抽出するために必要な情報であるので、ＭＰＥＧ-2内の情報パケットとして必ず添付された状態で発信される。制御手段は、放送信号に含まれるＰＳＩＰを取得したときは、それを解析して得られたＶＣＴを参照することにより、受信する仮想チャンネル番号を特定し、その仮想チャンネル番号をＯＳＤ表示する。放送信号にＰＳＩＰが含まれてないとき等、何らかの事情によりＰＳＩＰを取得できないときは、ＭＰＥＧ-2データに含まれるＰＳＩを解析してサブチャンネルの構成情報を取得し、便宜上のサブチャンネル番号を割り当てる。本構成では、ＰＳＩの１つであるＰＡＴ及びＰＭＴを解析して、各サブチャンネルに便宜上の仮想サブチャンネル番号を割り当てる。さらに、物理チャンネル番号と、この便宜上の仮想サブチャンネル番号とによってＯＳＤ表示のための便宜上の仮想チャンネル番号を付与する。このＭＰＥＧ-2データに含まれるＰＳＩを解析して得られた便宜上の仮想サブチャンネル番号は、ＰＭＴのプログラムの順番に従って割り当てたものであり、放送局が任意に設定することができる本来のサブチャンネル番号とは必ずしも一致するものではない。そこで、ユーザが、ＭＰＥＧ-2データを解析して得られた便宜上の仮想チャンネル番号と、ＰＳＩＰを解析して得られた本来の仮想チャンネル番号とを区別できるように、それぞれを異なる形態で区別してＯＳＤ表示させる。このＯＳＤ表示の区別はユーザの要望により無効にしてもよい。この場合、便宜上の仮想チャンネル番号は、通常の仮想チャンネル番号と同様のＯＳＤ表示として出力される。

【００１０】また、請求項２の発明は、装置本体にチャンネル変更指令を入力するための入力手段と、放送局からＡＴＳＣ（Advanced Television Systems Committee）の規格に準拠させてＭＰＥＧ（Moving Picture Experts Group）-2の情報パケットにＰＳＩＰ（Program and System Information Protocol）の情報パケットを付加した上で発信されるデジタル放送信号を受信する受信手段と、受信手段により受信したデジタル放送信号から映像信号、音声信号及び制御信号を抽出する信号抽出手段と、信号抽出手段によって抽出された映像信号又はアナログ放送信号に含まれる映像信号を復号して、その復号信号を本装置に接続された映像を表示する表示手段に出力するデジタル復号手段と、信号抽出手段によって抽出された制御信号を記憶する記憶手段と、表示手段に所定のオンスクリーンディスプレイ（以下、ＯＳＤと記す）表示をさせるＯＳＤ出力手段と、上記装置の各手段を制御する制御手段とを備え、受信チャンネル番号を表示手段よりＯＳＤ表示する受信チャンネル番号表示機能を有する放送受信装置において、同一又は同一系統の放送局からデジタル放送信号とアナログ放送信号とが互いに異なる物理チャンネルにより発信され、デジタル放送信号は、物理チャンネルごとに発信され、１つの物理チャンネルにつき１又は複数のコンテンツを発信するためのサブチャンネルを含み、かつ、このサブチャンネルにアナログ放送の物理チャンネル番号と同一の番号とサブチャンネル番号とからなる仮想チャンネル番号が付与されており、制御手段は、制御信号の中からＭＰＥＧ-2の情報パケットを取得し、その中に含まれるＰＳＩ（Program Specific Information）を解析して検出した各サブチャンネルの順番に従って各サブチャンネルに便宜上の仮想サブチャンネル番号を割り当て、物理チャンネル番号と、便宜上の仮想サブチャンネル番号とからなるチャンネル番号を便宜上の仮想チャンネル番号として、ＯＳＤ表示を行うものである。

【００１１】この構成においては、請求項１と同様に、放送信号はＭＰＥＧ-2規格により動画圧縮されパケット化されたＭＰＥＧ-2データで放送局から発信される。制御信号として仮想チャンネルに関する情報を有するＰＳＩＰの情報パケットが付加される。ＭＰＥＧ-2データには、番組の構成に関する情報を有するＰＳＩ等を含んでいる。制御手段は、ＭＰＥＧ-2データに含まれるＰＳＩを解析して便宜上のサブチャンネル番号を割り当てる。すなわち、ＰＳＩを解析して検出した各サブチャンネルの順番に従って便宜上の仮想サブチャンネル番号として割り当てる。さらに、物理チャンネル番号と、この便宜上の仮想サブチャンネル番号とによってＯＳＤ表示のための便宜上の仮想チャンネル番号を付与し、これをＯＳＤ表示する。

【００１２】また、請求項３の発明は、請求項２に記載の受信チャンネル番号表示機能を有する放送受信装置において、制御手段は、信号抽出手段が抽出した制御信号

に含まれるＰＳＩＰ（Program and System Information Protocol）を取得したときは、該ＰＳＩＰを解析して得られたＶＣＴ（Virtual Channel Table）を参照することにより、受信する仮想チャンネル番号を特定し、該仮想チャンネル番号をＯＳＤ表示するものである。この構成においては、ＰＳＩＰを取得したときは、このＰＳＩＰを解析することにより、放送局が任意に設定した仮想チャンネル番号を取得して、これをＯＳＤ表示する。

【００１３】

【発明の実施の形態】以下、本発明を具体化した一実施形態に係るデジタル放送受信装置（セットトップボックス：以下ＳＴＢと記す）について図面を参照して説明する。図１はＳＴＢのブロック構成を示す。ＳＴＢ１は、本体ボタン又はリモコン等の入力装置１１（入力手段）を用いたユーザからのチャンネル変更等の操作入力に応じて、テレビジョン放送局から発信されＡＴＳＣに準拠する符号化されたデジタル放送信号をアンテナ１０により受信し、ＮＴＳＣに準拠した映像信号に変換して表示装置１２（表示手段）に表示させる装置である。チャンネル変更の操作としては、例えば、入力装置に備えられている“テンキー（数字キー）”で直接的にチャンネル番号を入力して変更する方法と、同入力装置１１に備えられている“アップダウンキー（矢印キー）”を操作して上下に隣接するチャンネルに変更する方法が採られている。ＳＴＢ１は、ユーザが、後者の“アップダウンキー”を操作してチャンネルを変更したときにも、変更先の仮想チャンネル番号を即座に理解できるように、ＰＳＩＰを取得・解析することにより受信する仮想チャンネル番号を特定し、表示装置１２にＯＳＤ表示させる機能を有している。なお、ＡＴＳＣでは、ＭＰＥＧ-2規格により動画圧縮されパケット化されたデジタル放送信号が発信されている。

【００１４】ＳＴＢ１は、例えば、８ＶＳＢ（Vestigial Side Band）の変調方式により送信されるデジタル放送信号を受信するチューナ２（受信手段）と、チューナ２により受信したデジタル放送信号をトランスポートストリーム（Transport Stream：以下、ＴＳと記す）信号に変換するＴＳ変換回路４と、ＴＳ変換回路４が変換したＴＳ信号を解析して映像信号を復号し、表示装置１２に映像を表示させるＴＳ解析回路６と、デジタル放送の各メインチャンネルの発信周波数、放送言語等に関するチャンネル情報を記憶するメモリ７（記憶手段）と、所定の放送言語のデジタル音声信号を抽出し、スピーカ装置１５に音声を出力させる音声出力回路９と、受信装置各部を制御するＣＰＵからなる制御部８（制御手段）とを備えている。

【００１５】チューナ２は、アンテナ１０により受信されたデジタル放送信号の供給を受け、ユーザが入力装置１１から制御部８に入力した指令に応じて選局動作を行ない、ユーザが入力したチャンネルに対応する周波数帯域に存在する８ＶＳＢ変調のデジタル放送信号を受信する。ＴＳ変換回路４は、チューナ２が受信した８ＶＳＢ変調の放送信号をＴＳ信号に変換する。

【００１６】ＴＳ解析回路６は、ＴＳ変換回路４が変換したＴＳ信号を解析し、必要に応じてＯＳＤ表示を付加した映像信号を表示装置１２に出力する。図２は、ＴＳ解析回路６のブロック構成を示す。ＴＳ解析回路６は、トランスポートパーサ６ａ（信号抽出手段）と、外部メモリインターフェース６ｂと、ビデオデコーダ６ｃ（デジタル復号手段）と、ディスプレイコントローラ６ｄと、ＯＳＤ回路６ｅ（ＯＳＤ出力手段）と、デジタルビデオエンコーダ６ｆと、オーディオインターフェース６ｇと、ホストプロセッサインターフェース６ｈとＰＬＬ（Phase Locked Loop）回路６ｉとを備えている。トランスポートパーサ６ａは、ＴＳ変換回路４から伝送されたＴＳ信号を取得し、これを映像信号、音声信号及び制御信号に分解する。外部メモリインターフェース６ｂは、ホストプロセッサインターフェース６ｈを介して制御部８からの指令を受け、トランスポートパーサ６ａ、ビデオデコーダ６ｃ及びディスプレイコントローラ６ｄとメモリ７との接続を司る。例えば、トランスポートパーサ６ａによって分解された映像信号、音声信号及び制御信号は、それぞれ、外部メモリインターフェース６ｂを介してメモリ７に格納される。

【００１７】ビデオデコーダ６ｃは、制御部８からの指令を受け、メモリ７に格納させた映像信号を読み出して復号する。ディスプレイコントローラ６ｄは、制御部８からの指令を受け、ビデオデコーダ６ｃが復号した映像信号をＮＴＳＣのフォーマットに変換する。ＯＳＤ回路６ｅは、制御部８からの指令を受け、ビデオデコーダ６ｃが変換したＮＴＳＣの映像信号をデジタルビデオエンコーダ６ｆに送出する他、必要に応じて映像信号にＯＳＤ表示を付加した信号をデジタルビデオエンコーダ６ｆに送出する。このＯＳＤ回路６ｅは、制御部８からの指令に応じて、１フレームの映像信号ごとにＯＳＤ表示を付加する演算処理を行い、所定の色によるＯＳＤ表示を表示装置１２に表示させることができる。また、上記演算処理を行うためにＯＳＤ回路６ｅには、メモリが内蔵されている。

【００１８】デジタルビデオエンコーダ６ｆは、制御部８からの指令を受け、ＯＳＤ回路６ｅから送出された映像信号をアナログ信号に変換して表示装置１２に出力する。オーディオインターフェース６ｇは、トランスポートパーサ６ａが分解した音声信号を音声出力回路９に送出する。また、ホストプロセッサインターフェース６ｈは、制御部８からの指令をトランスポートパーサ６ａと、外部メモリインターフェース６ｂと、ビデオデコーダ６ｃと、ディスプレイコントローラ６ｄと、ＯＳＤ回路６ｅと、デジタルビデオエンコーダ６ｆに伝送する。また、ＰＬＬ回路６ｉは、入力されるクロック信号に基

づいて局部発振周波数を所定の周波数に一致させる。

【００１９】メモリ７は、トランスポートパーサ６ａが分解したＭＰＥＧ-2データを記憶する。このＭＰＥＧ-2データについては、後程、図３を参照して詳述する。制御部８は、ユーザによる入力装置１１を用いた入力操作を受けて、各部の制御をデータバス（Data-Bus）を通して行う。例えば、制御部８は、メモリ７に格納された制御信号に含まれるＰＳＩＰを読み出して解析し、それに含まれるステータス信号に基づいて受信するチャンネルの仮想チャンネル番号を取得し、この仮想チャンネル番号をＯＳＤ回路６ｅ、デジタルビデオエンコーダ６ｆを介して表示装置１２に出力させる。

【００２０】音声出力回路９は、オーディオインターフェース６ｇから取得した音声信号をスピーカ装置１５に対応する音声信号に変換し、この音声信号をスピーカ装置１５に送出する。具体的には、制御部８から指示された放送言語に関する音声信号を抽出し、復号処理し、アナログ信号に変換している。入力装置１１は、ユーザによるチャンネル変更等の操作指令を制御部８に対して入力するための装置である。この入力装置１１の例としては、ＳＴＢ１の前面に設けた本体ボタンや、赤外線等を用いてＳＴＢ１の動作指令を行うリモコン等が挙げられる。表示装置１２は、テレビジョン受像機の表示画面を用いてもよいし、また、ＣＲＴの他、ＬＣＤ（Liquid Crystal Display）やＰＤＰ（Plasma Display Panel）等のフラットパネルディスプレイ装置であってもよい。その際、表示装置１２が、デジタル信号の入力に対応していれば、デジタルビデオエンコーダ６ｆを介さずに、ＯＳＤ回路６ｅから表示装置１２の入力端子に直接に接続する構成であってもよい。スピーカ装置１５は、音声出力回路９に接続され、音声出力回路９にて処理された音声信号に基いて音声を出力する。

【００２１】制御部８は、上述したように、ＰＳＩＰを解析し、受信するチャンネルの仮想チャンネル番号を取得し、表示装置１２にＯＳＤ表示させる。さらに、制御部８は、何らかの事情により、ＰＳＩＰを取得できなかった場合は、放送信号に含まれるＭＰＥＧ-2データを解析して、便宜上の仮想チャンネル番号を付与する。

【００２２】図３は、ＴＳ信号としてメモリに記憶されている、ＭＰＥＧ-2データの一例を示している。ＭＰＥＧ-2データは、ＰＳＩと音声信号（音声データ）112及び映像信号（画像データ）113を有している。上記ＰＳＩは、ＭＰＥＧ-2データ内に必ず含まれるデータであり、仮想チャンネル番号や放送局名等は持たないが、番組データ構成情報としてのＰＡＴ 110及びＰＭＴ 111a，111bを有している。ＰＡＴ 110には、受信する物理チャンネル内で放送されている全てのサブチャンネルにそれぞれ対応するプログラム番号のＰＭＴ IDに関する情報が格納されている。例えば、サブチャンネルの1つであるプログラム①のＰＭＴ IDは0x0010であり、別のサブチャンネルであるプログラム②のＰＭＴ IDは0x0011であるといった情報が格納されている。ここで、プログラム①のサブチャンネルを受信するときは、上記ＰＡＴ 110の情報に従ってID番号が0x0010であるＰＭＴ 111aに格納されたデータを読み出す。ＰＭＴ 111aには、プログラム①の画像データIDは0x0001であり、同音声データIDは0x000aであるといった情報が格納されている。このＰＭＴ 111aの情報に従って、ビデオデコーダ６ｃが画像データ 113のうち0x0001のID番号が付与されたものを順次読出し、音声出力回路９が音声データ 112のうち0x000aのID番号が付与されたものを順次読出し、プログラム①のサブチャンネルの映像信号及び音声信号をそれぞれデコードする。このように、ＰＡＴ 110は、放送信号から映像信号及び音声信号を抽出するために、ＭＰＥＧ-2データ内に必ず含まれている。

【００２３】制御部８は、ＭＰＥＧ-2データのＰＡＴ 110に格納されている情報を解析することにより、受信する物理チャンネル内で放送されている全てのサブチャンネルにそれぞれ対応するＰＭＴ IDを取得することができる。制御部８は、各サブチャンネルにそれぞれ対応するＰＭＴ IDの順番に従って便宜上の仮想サブチャンネル番号を割り当てる。なお、このようにして割り当てた便宜上のサブチャンネル番号は、ＰＭＴ IDの順番に従う番号となるため、放送局が任意に設定した仮想サブチャンネル番号とは必ずしも一致するものではない。

【００２４】図４は、上述のようにして、ＭＰＥＧ-2データを解析して物理チャンネル“２”について取得した便宜上の仮想チャンネル番号に関する情報を表示するチャンネルマップの一例を示している。ここで物理チャンネル“２”の仮想のメインチャンネル番号は、ＰＳＩＰを取得できなかったため、便宜上の番号として物理チャンネルと同一の“２”を付与している。そして、仮想サブチャンネル番号には、上記のごとく割り当てた便宜上の仮想サブチャンネル番号である“１”，“２”を付与する。この便宜上の仮想サブチャンネル番号は、ＰＡＴ 110のプログラム番号を割り当てているので、連続した番号で構成される。また、物理チャンネル“５”には、通常通り、ＰＳＩＰを解析して取得した仮想のメインチャンネル番号“１５”と仮想サブチャンネル番号“１，１５，３０”が表示される。この仮想サブチャンネル番号は、放送局が任意に設定できるものであり、この例のように不連続な番号を有する場合もある。このチャンネルマップでは、ＭＰＥＧ-2データのＰＡＴ 110を解析して得られた便宜上の仮想チャンネル番号とＰＳＩＰを解析して得られた本来の仮想チャンネル番号とを容易に区別できるように、半透明のＯＳＤ表示を行い、さらにアンダーラインを付している。

【００２５】また、図５は、ＭＰＥＧ-2データのＰＡＴから取得した便宜上の仮想チャンネル“２－１”（メインチャンネルが“２”、サブチャンネルが“１”）につ

いて、映像に付加して表示装置１２にＯＳＤ表示させた画面を示している。図５（ａ）では、「ＰＳＩＰを発見できなかった」旨の通知メッセージが付記されている。また、図５（ｂ）では、便宜上の仮想チャンネル番号“２－１”を点滅表示させることにより、通常の仮想チャンネル番号ではないことを表示している。また、図５（ｃ）では、便宜上の仮想チャンネル番号“２－１”を半透明のＯＳＤ表示を行うことにより、通常の仮想チャンネル番号ではないことを示している。

【００２６】このように、本ＳＴＢ１によれば、ＰＳＩＰを取得できない場合であっても、ＭＰＥＧ-2データに必ず含まれているＰＡＴ 110を解析することにより、便宜上の仮想チャンネル番号を取得しＯＳＤ表示することができる。また、こうして取得した便宜上の仮想チャンネル番号を、ＰＳＩＰから取得した仮想チャンネル番号とは違う旨の、通常とは異なる形態でＯＳＤ表示を行うことにより、ユーザは、容易にその旨を判断することができる。

【００２７】なお、本発明は上記実施形態の構成に限られることなく種々の変形が可能であり、例えば、便宜上の仮想チャンネル番号は、通常の仮想チャンネル番号と区別することなく、同様のＯＳＤ表示をしてもよい。また、ＳＴＢ１は、ＡＴＳＣのデジタル放送信号に加えて、ＮＴＳＣのアナログ放送信号をも受信することができる構成としてもよい。この場合、チューナ２はアナログ放送の配信される帯域の放送信号をも受信できるものとされ、ＳＴＢ１はチューナ２が受信したアナログ放送信号を復号するアナログデコーダを別途備えたものとされる。さらにまた、便宜上の仮想チャンネルの表示は、ＯＳＤ表示に限られることなく、別途設けた液晶ディスプレイ等の表示装置に表示させるものであってもよい。

【００２８】

【発明の効果】以上のように請求項１の発明によれば、デジタル／アナログ放送受信装置において、ＰＳＩＰを取得できない場合であっても、ＭＰＥＧ-2の情報パケットに含まれるＰＳＩの1つであるＰＡＴ及びＰＭＴを解析することにより、便宜上の仮想チャンネル番号を取得しＯＳＤ表示することができる。従って、ユーザは、自ら選択したチャンネルの仮想チャンネル番号を表示画面上で確認することができ、チャンネルの選択が容易に行＊えるようになる。また、ＰＡＴ及びＰＭＴを解析して取得した便宜上の仮想チャンネル番号は、ＰＳＩＰを解析して取得した仮想チャンネル番号とは相異なる形態のＯＳＤ表示がなされるので、ユーザは、容易に両者を区別することができる。

【００２９】請求項２の発明によれば、デジタル放送受信装置において、ＰＳＩＰを取得できない場合であっても、ＭＰＥＧ-2の情報パケットに含まれるＰＳＩを解析することにより、便宜上の仮想チャンネル番号を取得しＯＳＤ表示することができる。従って、ユーザは、自ら選択したチャンネルの仮想チャンネル番号を表示画面上で確認することができ、チャンネルの選択が容易に行えるようになる。

【００３０】請求項３の発明によれば、デジタル放送受信装置において、ＰＳＩＰを取得したときは、それを解析して仮想チャンネル番号を取得しＯＳＤ表示するので、ユーザは、放送局が任意に設定した仮想チャンネル番号を知ることができる。

【図面の簡単な説明】

【図１】　本発明の一実施形態によるデジタル放送受信装置のブロック構成図。

【図２】　同装置のＴＳ解析回路のブロック構成図。

【図３】　同装置が解析するＭＰＥＧ-2データを示した図

【図４】　同データを解析して得られた便宜上の仮想チャンネル番号を表示するチャンネルマップを示した図。

【図５】　同装置により画面表示される便宜上の仮想チャンネル番号の表示例を示した図。

【符号の説明】

１　　ＳＴＢ（放送受信装置）
２　　チューナ（受信手段）
６ａ　トランスポートパーサ（信号抽出手段）
６ｃ　ビデオデコーダ（デジタル復号手段）
６ｅ　ＯＳＤ回路（ＯＳＤ出力手段）
７　　メモリ（記憶手段）
８　　制御部（制御手段）
１１　入力装置（入力手段）
１２　表示装置（表示手段）
110　ＰＡＴ
111a、111b　ＰＭＴ

【図４】

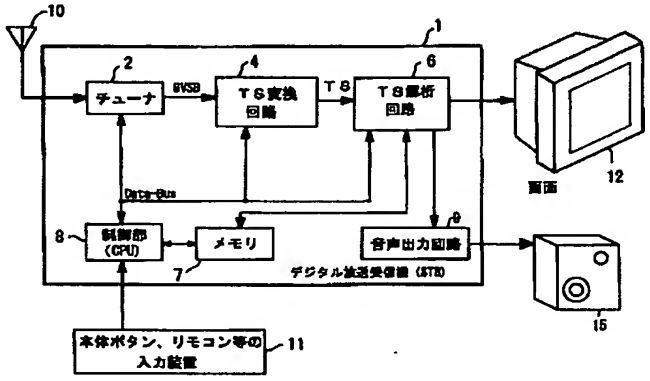
チャンネルマップ

物理CH No.	Digital/Analog	仮想Main Ch No.	仮想Sub Ch No.
1	Non		-
2	Digital	2	1 2
3	Non		-
4	Analog		-
5	Digital	15	1 15 30
6	Non		-

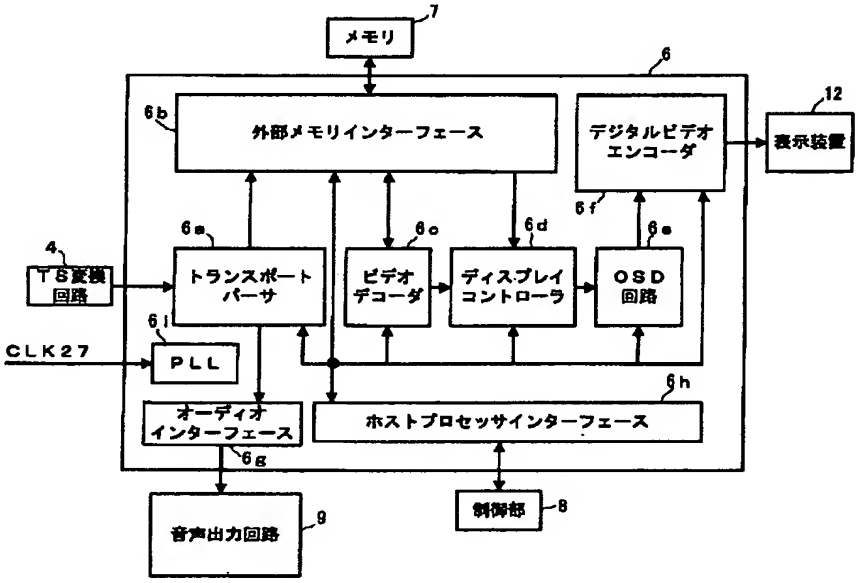
上記データを解析してメインチャンネル番号、サブチャンネル番号を得る。

PSIPから得られるチャンネル番号とは異なる半透明の表示を出力する。

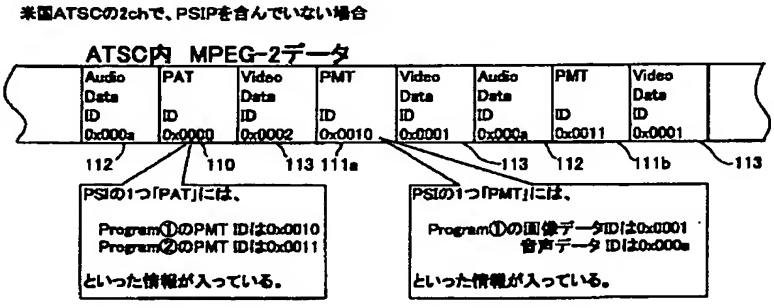
【図１】


10
1
2
チューナ
8VSB
4
ＴＳ変換回路
ＴＳ
6
ＴＳ解析回路
画面
12
Data Bus
8
制御部（CPU）
メモリ
7
9
音声出力回路
デジタル放送受信機（STB）
15
本体ボタン、リモコン等の入力装置
11

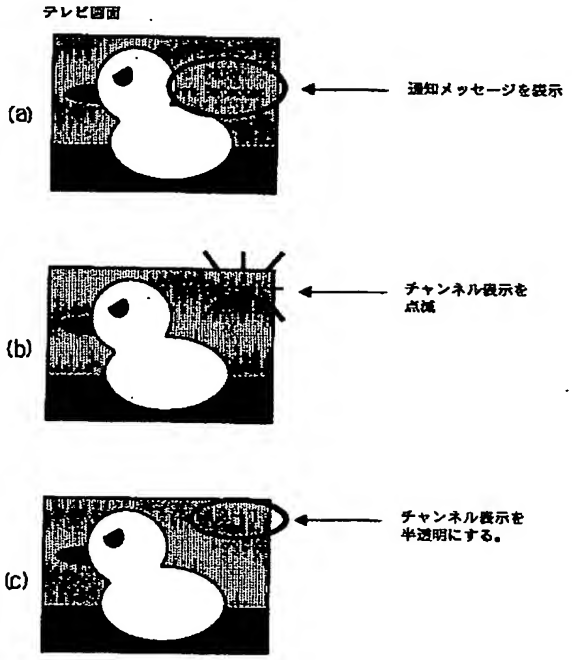
【図２】


メモリ
7
6
6b
外部メモリインターフェース
デジタルビデオエンコーダ
12
表示装置
6f
6a
6c
6d
6e
4
ＴＳ変換回路
トランスポートパーサ
ビデオデコーダ
ディスプレイコントローラ
ＯＳＤ回路
6i
CLK27
ＰＬＬ
6h
オーディオインターフェース
ホストプロセッサインターフェース
6g
音声出力回路
9
制御部
8

【図３】


米国ATSCの2chで、PSIPを含んでいない場合
ATSC内　MPEG-2データ
Audio Data ID 0x000a
PAT ID 0x0000
Video Data ID 0x0002
PMT ID 0x0010
Video Data ID 0x0001
Audio Data ID 0x000a
PMT ID 0x0011
Video Data ID 0x0001
112
110
113
111a
113
112
111b
113
PSIの1つ「PAT」には、
Program①のPMT IDは0x0010
Program②のPMT IDは0x0011
といった情報が入っている。
PSIの1つ「PMT」には、
Program①の画像データIDは0x0001
音声データIDは0x000a
といった情報が入っている。

【図５】



フロントページの続き

(72)発明者　石原　一秀
大阪府大東市中垣内７丁目７番１号　船井
電機株式会社内
(72)発明者　片山　貴寛
大阪府大東市中垣内７丁目７番１号　船井
電機株式会社内

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BA27 BA28 CA02 CA09 CA18
CB10 DA01 DA05
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DA13 EA01 EB37 EB45

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CLAIMS

[Claim(s)]
[Claim 1]An input means for inputting channel change instructions into a device main frame.
You make it based on a standard of ATSC (Advanced Television Systems Committee) from a broadcasting station, and it is PSIP (Program.) to an information packet of MPEG(Moving Picture Experts Group)-2. A reception means which receives digital one / analog broadcasting signal sent after adding an information packet of and System Information Protocol.
A signal extraction means to extract a video signal, an audio signal, and a control signal from a digital broadcasting signal received by said reception means.
Digital one / analog decoding means outputted to a displaying means which displays an image which decoded a video signal contained in a video signal or an analog broadcasting signal extracted by said signal extraction means, and with which the decoded signal was connected to this equipment
A memory measure which memorizes a control signal extracted by said signal extraction means,
A receiving channel number display function which is provided with an OSD output means which gives a predetermined onscreen display (it is hereafter described as OSD) indication to said displaying means, and a control means which controls each means of the above-mentioned equipment, and carries out the OSD display of the receiving channel number from said displaying means.
It is a broadcast receiving set which has the receiving channel number display function provided with the above, From a broadcasting station of a same or same system, a digital broadcasting signal and an analog broadcasting signal are sent by mutually different physical channel, and a digital broadcasting signal, A subchannel for being sent for said every physical channel and sending 1 per physical channel or two or more contents is included, And a virtual channel number which consists of the same number as a physical channel number and a subchannel number of said analog broadcasting is given to this subchannel, and said control means, By acquiring an information packet of said PSIP out of a control signal which said signal extraction means extracted, and referring to VCT (Virtual Channel Table) produced by analyzing it, When a virtual channel number to receive is specified, an OSD display of this virtual channel number is performed and PSIP is not able to be acquired out of said control signal, an information packet of said MPEG-2 is acquired, A virtual subchannel number on expedient is assigned to each subchannel according to turn of each subchannel of having analyzed and detected PAT (Program Association Table) and PMT (Program Map Table) which are contained in it, A virtual channel number which specified a channel number which consists of said physical channel number and a virtual subchannel number on [said] expedient by analyzing said VCT as a virtual channel number on expedient performs an OSD display of a different form.

[Claim 2]An input means for inputting channel change instructions into a device main frame.
You make it based on a standard of ATSC (Advanced Television Systems Committee) from a broadcasting station, and it is PSIP (Program.) to an information packet of MPEG(Moving Picture Experts Group)-2. A reception means which receives a digital broadcasting signal sent after adding an information packet of and System Information Protocol.

A signal extraction means to extract a video signal, an audio signal, and a control signal from a digital broadcasting signal received by said reception means.
A digital decoding means outputted to a displaying means which displays an image which decoded a video signal contained in a video signal or an analog broadcasting signal extracted by said signal extraction means, and with which the decoded signal was connected to this equipment.
A memory measure which memorizes a control signal extracted by said signal extraction means,
A receiving channel number display function which is provided with an OSD output means which gives a predetermined onscreen display (it is hereafter described as OSD) indication to said displaying means, and a control means which controls each means of the above-mentioned equipment, and carries out the OSD display of the receiving channel number from said displaying means.
It is a broadcast receiving set which has the receiving channel number display function provided with the above, From a broadcasting station of a same or same system, a digital broadcasting signal and an analog broadcasting signal are sent by mutually different physical channel, and a digital broadcasting signal, A subchannel for being sent for said every physical channel and sending 1 per physical channel or two or more contents is included, And a virtual channel number which consists of a physical channel number, the same number, and a subchannel number of said analog broadcasting is given to this subchannel, and said control means, An information packet of said MPEG-2 is acquired out of said control signal, A virtual subchannel number on expedient is assigned to each subchannel according to turn of each subchannel of having analyzed and detected PSI (Program Specific Information) contained in it, An OSD display is performed for a channel number which consists of said physical channel number and a virtual subchannel number on [said] expedient as a virtual channel number on expedient.

[Claim 3]When PSIP (Program and System Information Protocol) contained in a control signal which said signal extraction means extracted is acquired, said control means, By referring to VCT (Virtual Channel Table) produced by analyzing this PSIP, A broadcast receiving set which has the receiving channel number display function according to claim 2 specifying a virtual channel number to receive and carrying out the OSD display of this virtual channel number.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates to the digital broadcasting receiving set which has a receiving channel number display function which carries out an OSD display for the virtual channel number which starts a broadcast receiving set, especially is received to a displaying means.
[0002]
[Description of the Prior Art]Conventionally, in cable digital broadcasting etc., the 64QAM modulator is known as a modulator used when sending the image and audio signal which carried out compression encoding by MPEG-2 standard via a CATV transmission line (for example, refer to JP,2000-197020,A). This enables specification of whether the obstacle occurred with which 64QAM modulator from the displayed above-mentioned channel number, when a channel number is displayed on users' (addressee) broadcast receiving set and an obstacle occurs during broadcast reception. This modulator is used in the case of the broadcasting station side's dispatch of a broadcasting signal. Only the channel to which it can view and listen is outputted to a display screen, and the digital broadcasting receiving set which made a user's channel selection operation easy is known (for example, refer to JP,H10-200868,A).
[0003]By the way, in North America, the digital broadcasting based on ATSC (Advanced Television Systems Committee) from a broadcasting station is distributed in recent years. This digital broadcasting is received, The broadcast receiving set (set top box: describe it as STB below) for changing into the signal which the television receiver of analog broadcasting correspondence of existing NTSC (National Television Systems Committee) can televise is spreading. It is possible to give the function indicated by this STB at JP,H10-200868,A.
[0004]The digital broadcasting signal is sent in the digital broadcasting of ATSC by different physical channel from an analog broadcasting signal. One physical channel 1 or two or more contents including the subchannel for sending to this subchannel. The virtual channel number which consists of the same number (main channel number) as a physical channel number and subchannel number of the analog broadcasting sent from the broadcasting station of a same or same system is given. Therefore, the virtual channel is constituted by the main channel and the subchannel hierarchical.
[0005]The broadcasting signal of digital broadcasting consists of a video signal, an audio signal, and a control signal, and in the digital broadcasting of ATSC. A duty is imposed so that PSIP (Program and System Information Protocol) included the information about a virtual channel number or a broadcasting station name may be attached to the above-mentioned control signal and it may be sent to it. The control section of STB can specify the virtual channel number to receive by referring to VCT (Virtual Channel Table) obtained by acquiring and analyzing this PSIP. In digital broadcasting, as already stated, each channel is constituted by the main channel number and the subchannel number hierarchical, and since the composition is complicated, the user may be unable to understand composition of the channel which oneself chose. Then, STB carries out the OSD display of the virtual channel number which specified [above-mentioned] to a display device, and is aiming at improvement in a user's user-friendliness.

[0006]
[Problem to be solved by the invention]However, PSIP cannot be acquired, when the office which is sending the digital broadcasting signal without attaching PSIP as a control signal depending on a broadcasting station also exists and the channel of such a broadcasting station is received. Even if a broadcasting station attaches PSIP and is sending the broadcasting signal, acquisition of PSIP may go wrong according to a certain situation of inaccurate PSIP data having been added, for example to the signal of PSIP. Thus, when PSIP is unacquirable, even if possible, since it is unknown, acquiring a video signal and receiving a picture cannot perform the OSD display, and a user's user-friendliness is not good [a thing / the virtual channel number].
[0007]This invention is made in order to solve the problem mentioned above, and it is a thing. Also in the case where the purpose is not able to acquire PSIP contained in a broadcasting signal in a receiving set, By displaying the channel number on expedient, it is providing the broadcast receiving set which has a display function of the receiving channel number which aimed at improvement in user-friendliness for the channel change as an easy thing for a user.

[0008]
[Means for solving problem]To achieve the above objects, invention of Claim 1, The input means for inputting channel change instructions into a device main frame, You make it based on the standard of ATSC (Advanced Television Systems Committee) from a broadcasting station, and it is PSIP (Program.) to the information packet of MPEG(Moving Picture Experts Group)-2. The reception means which receives digital one / analog broadcasting signal sent after adding the information packet of and System Information Protocol, A signal extraction means to extract a video signal, an audio signal, and a control signal from the digital broadcasting signal received by the reception means, The video signal contained in the video signal or analog broadcasting signal extracted by the signal extraction means is decoded, Digital one / analog decoding means outputted to the displaying means which displays the image with which the decoded signal was connected to this equipment, It has a memory measure which memorizes the control signal extracted by the signal extraction means, an OSD output means which gives a predetermined onscreen display (it is hereafter described as OSD) indication to a displaying means, and a control means which controls each means of the above-mentioned equipment, In the broadcast receiving set which has a receiving channel number display function which carries out the OSD display of the receiving channel number from a displaying means, From the broadcasting station of a same or same system, a digital broadcasting signal and an analog broadcasting signal are sent by mutually different physical channel, and a digital broadcasting signal, The subchannel for being sent for every physical channel and sending 1 per physical channel or two or more contents is included, And the virtual channel number which consists of the same number as a physical channel number and subchannel number of analog broadcasting is given to this subchannel, and a control means, By acquiring the information packet of PSIP out of the control signal which the signal extraction means extracted, and referring to VCT (Virtual Channel Table) produced by analyzing it, When the virtual channel number to receive is specified, the OSD display of this virtual channel number is performed and PSIP is not able to be acquired out of a control signal, the information packet of MPEG-2 is acquired, The virtual subchannel number on expedient is assigned to each subchannel according to the turn of each subchannel of having analyzed and detected PAT (Program Association Table) and PMT (Program Map Table) which are contained in it, The virtual channel number which specified the channel number which consists of a physical channel number and a virtual subchannel number on expedient by analyzing VCT as a virtual channel number on expedient performs the OSD display of a different form.
[0009]In this composition, a digital broadcasting signal is sent from a broadcasting station including a video signal, an audio signal, and a control signal by the packet-ized data (MPEG-2 data) in which animation compression was carried out by MPEG-2 standard. The information packet of PSIP which has the information about the virtual channel for receiving ATSC broadcast is added to a control signal. PSI (Program Specific Information) etc. which have the information about the composition of a program are contained in the information packet of

MPEG-2. In ATSC, a duty is imposed so that PSIP may be attached to a digital broadcasting signal and may be sent, but being sent where this is not necessarily attached depending on a broadcasting station is not restricted. On the other hand, since PSI is information required in order to extract a video signal and an audio signal, it is sent in the state where it was always attached as an information packet in MPEG-2. When PSIP contained in a broadcasting signal is acquired, by referring to VCT produced by analyzing it, a control means specifies the virtual channel number to receive, and carries out the OSD display of the virtual channel number. When PSIP is not contained in a broadcasting signal and PSIP cannot be acquired according to a certain situation, PSI contained in MPEG-2 data is analyzed, the configuration information on a subchannel is acquired, and the subchannel number on expedient is assigned. In this composition, PAT and PMT which are one of the PSI(s) are analyzed, and the virtual subchannel number on expedient is assigned to each subchannel. A physical channel number and the virtual subchannel number on [this] expedient give the virtual channel number on expedient for an OSD display. Assigning the virtual subchannel number after [expedient] being obtained by analyzing PSI contained in this MPEG-2 data according to the turn of the program of PMT, the original subchannel number which a broadcasting station can set up arbitrarily is not necessarily a match. Then, a user distinguishes and does the OSD display of each with a different form so that the virtual channel number after [expedient] being obtained by analyzing MPEG-2 data, and the original virtual channel number acquired by analyzing PSIP can be distinguished. Distinction of this OSD display may be repealed by a user's request. In this case, the virtual channel number on expedient is outputted as the same OSD display as the usual virtual channel number.

[0010]An input means for invention of Claim 2 to input channel change instructions into a device main frame, You make it based on the standard of ATSC (Advanced Television Systems Committee) from a broadcasting station, and it is PSIP (Program.) to the information packet of MPEG(Moving Picture Experts Group)-2. The reception means which receives the digital broadcasting signal sent after adding the information packet of and System Information Protocol, A signal extraction means to extract a video signal, an audio signal, and a control signal from the digital broadcasting signal received by the reception means, The video signal contained in the video signal or analog broadcasting signal extracted by the signal extraction means is decoded, The digital decoding means outputted to the displaying means which displays the image with which the decoded signal was connected to this equipment, It has a memory measure which memorizes the control signal extracted by the signal extraction means, an OSD output means which gives a predetermined onscreen display (it is hereafter described as OSD) indication to a displaying means, and a control means which controls each means of the above-mentioned equipment, In the broadcast receiving set which has a receiving channel number display function which carries out the OSD display of the receiving channel number from a displaying means, From the broadcasting station of a same or same system, a digital broadcasting signal and an analog broadcasting signal are sent by mutually different physical channel, and a digital broadcasting signal, The subchannel for being sent for every physical channel and sending 1 per physical channel or two or more contents is included, And the virtual channel number which consists of the physical channel number, the same number, and subchannel number of analog broadcasting is given to this subchannel, and a control means, Acquire the information packet of MPEG-2 out of a control signal, and the virtual subchannel number on expedient is assigned to each subchannel according to the turn of each subchannel of having analyzed and detected PSI (ProgramSpecific Information) contained in it, An OSD display is performed for the channel number which consists of a physical channel number and a virtual subchannel number on expedient as a virtual channel number on expedient.

[0011]In this composition, a broadcasting signal is sent from a broadcasting station like Claim 1 by MPEG-2 packet-ized data in which animation compression was carried out by MPEG-2 standard. The information packet of PSIP which has the information about a virtual channel as a control signal is added. PSI etc. which have the information about the composition of a program are included in MPEG-2 data. A control means analyzes PSI contained in MPEG-2 data, and assigns the subchannel number on expedient. That is, PSI is assigned as a virtual subchannel number on expedient according to the turn of each subchannel analyzed and detected. By the

physical channel number and the virtual subchannel number on [this] expedient, the virtual channel number on expedient for an OSD display is given, and the OSD display of this is carried out.
[0012]Invention of Claim 3 the receiving channel number display function according to claim 2 in the broadcast receiving set which it has a control means, When PSIP (Program and System Information Protocol) contained in the control signal which the signal extraction means extracted is acquired, By referring to VCT (Virtual Channel Table) produced by analyzing this PSIP, the virtual channel number to receive is specified and the OSD display of this virtual channel number is carried out. In this composition, when PSIP is acquired, by analyzing this PSIP, a broadcasting station acquires the virtual channel number set up arbitrarily, and carries out the OSD display of this.
[0013]
[Mode for carrying out the invention]The digital broadcasting receiving set (set top box: describe it as STB below) hereafter applied to one embodiment which materialized this invention is explained with reference to Drawings. Drawing 1 shows the block configuration of STB. According to operational inputs, such as a channel change from the user who used the input devices 11 (input means), such as a body button or a remote control, STB1, It is equipment which receives the coded digital broadcasting signal which is sent from the Television Sub-Division broadcasting station, and is based on ATSC with the antenna 10, is changed into the video signal based on NTSC, and is displayed on the display device 12 (displaying means). How to input and change a channel number directly as operation of a channel change with "the ten key (numerical keypad)" with which the input device is equipped, for example, The method of changing into the channel which operates "the up-and-down key (arrow key)" with which the input device 11 is equipped, and adjoins up and down is taken. Also when a user operates the latter "up-and-down key" and changes a channel, STB1 so that he can understand the virtual channel number of change time immediately, The virtual channel number received by acquiring and analyzing PSIP is specified, and it has a function which carries out an OSD display to the display device 12. In ATSC, the digital broadcasting signal which animation compression was carried out [the digital broadcasting signal] by MPEG-2 standard and was packet-ized is sent.
[0014]STB1 is provided with the following.
For example, the tuner 2 (reception means) which receives the digital broadcasting signal transmitted by the modulation method of 8VSB (Vestigial Side Band).
The TS conversion circuit 4 which changes into a transport stream (below Transport Stream: describes it as TS) signal the digital broadcasting signal received with the tuner 2.
TS analysis circuit 6 which analyzes the TS signal which the TS conversion circuit 4 changed, decodes a video signal, and displays an image on the display device 12.
The memory 7 (memory measure) which memorizes the channel information about the dispatch frequency of each main channel of digital broadcasting, broadcast language, etc., The control section 8 (control means) which consists of the voice response circuit 9 which extracts the digital sound signal of predetermined broadcast language, and makes a sound output to the loudspeaker device 15, and a CPU which controls each part of a receiving set.

[0015]The tuner 2 receives supply of the digital broadcasting signal received by the antenna 10, channel selection operation is performed according to the instructions which the user inputted into the control section 8 from the input device 11, and the digital broadcasting signal of 8VSB abnormal conditions which exist in the frequency band corresponding to the channel which the user inputted is received. The TS conversion circuit 4 changes into a TS signal the broadcasting signal of 8VSB abnormal conditions which the tuner 2 received.
[0016]TS analysis circuit 6 analyzes the TS signal which the TS conversion circuit 4 changed, and outputs the video signal which added the OSD display if needed to the display device 12. Drawing 2 shows the block configuration of TS analysis circuit 6. TS analysis circuit 6 is provided with the following.
Transport purser 6a (signal extraction means).
External memory interface 6b.

Video decoder 6c (digital decoding means).
The controller displays 6d, OSD circuit 6e (OSD output means), the digital video encoder 6f, the audio interface 6g, the host processor interface 6h, and the PLL (Phase Locked Loop) circuit 6i. The transport purser 6a acquires the TS signal transmitted from the TS conversion circuit 4, and decomposes this into a video signal, an audio signal, and a control signal. The external memory interface 6b receives the instructions from the control section 8 via the host processor interface 6h, and manages connection between the transport purser 6a, the video decoder 6c and the controller displays 6d, and the memory 7. For example, the video signal, audio signal, and control signal which were decomposed by the transport purser 6a are stored in the memory 7 via the external memory interface 6b, respectively.
[0017]The video decoder 6c receives the instructions from the control section 8, and reads and decodes the video signal made to store in the memory 7. The controller displays 6d receive the instructions from the control section 8, and change into the format of NTSC the video signal which the video decoder 6c decoded. OSD circuit 6e receives the instructions from the control section 8, sends out the video signal of NTSC which the video decoder 6c changed to the digital video encoder 6f, and also it sends out the signal which added the OSD display to the video signal if needed to the digital video encoder 6f. This OSD circuit 6e can perform data processing which adds an OSD display for every video signal of one frame according to the instructions from the control section 8, and can display the OSD display by a predetermined color on the display device 12. In order to perform the above-mentioned data processing, the memory is built in OSD circuit 6e.
[0018]The digital video encoder 6f receives the instructions from the control section 8, changes into an analog signal the video signal sent out from OSD circuit 6e, and outputs it to the display device 12. The audio interface 6g sends out the audio signal which the transport purser 6a decomposed to the voice response circuit 9. The host processor interface 6h transmits the instructions from the control section 8 to the transport purser 6a, the external memory interface 6b, the video decoder 6c, the controller displays 6d, OSD circuit 6e, and the digital video encoder 6f. PLL circuit 6i coincides local oscillation frequency with predetermined frequency based on the clock signal inputted.
[0019]The memory 7 memorizes MPEG-2 data which the transport purser 6a disassembled. This MPEG-2 data will be later explained in full detail with reference to drawing 3. The control section 8 performs control of each part through a data bus (Data-Bus) in response to the alter operation using the input device 11 by a user. For example, the control section 8 reads and analyzes PSIP contained in the control signal stored in the memory 7, The virtual channel number of the channel received based on the status signal included in it is acquired, and this virtual channel number is made to output to the display device 12 via OSD circuit 6e and the digital video encoder 6f.
[0020]The voice response circuit 9 changes into the audio signal corresponding to the loudspeaker device 15 the audio signal acquired from the audio interface 6g, and sends out this audio signal to the loudspeaker device 15. Decoding processing of the audio signal about the broadcast language directed from the control section 8 was specifically extracted and carried out, and it has changed into the analog signal. The input device 11 is equipment for inputting operator command, such as a channel change by a user, to the control section 8. As an example of this input device 11, the body button provided in the front face of STB1, the remote control which performs the operating command of STB1 using infrared rays etc., etc. are mentioned. The display screen of a television receiver may be used for the display device 12, and they may be flat panel display devices, such as LCD (Liquid Crystal Display) and PDP (Plasma DisplayPanel) besides CRT. As long as the display device 12 supports the input of a digital signal in that case, it may be the composition directly connected to the input terminal of the display device 12 from OSD circuit 6e, without passing the digital video encoder 6f. It is connected to the voice response circuit 9, and the loudspeaker device 15 outputs a sound based on the audio signal processed in the voice response circuit 9.
[0021]PSIP is analyzed, and the control section 8 acquires the virtual channel number of the channel to receive, and is made to carry out an OSD display to the display device 12, as

mentioned above. When PSIP is not able to be acquired according to a certain situation, the control section 8 analyzes MPEG-2 data contained in a broadcasting signal, and gives the virtual channel number on expedient.

[0022]Drawing 3 shows an example of MPEG-2 data memorized by the memory as a TS signal. MPEG-2 data -- PSI and an audio signal (voice data) -- 112 and a video signal (image data) -- it has 113. Although the above PSI is data certainly contained and has neither a virtual channel number nor a broadcasting station name in MPEG-2 data, it has PAT 110 as program data configuration information and PMT 111a, and 111b. The information about PMT ID of the program number respectively corresponding to all the subchannels currently broadcast within the physical channel to receive is stored in PAT 110. For example, PMT ID of program ** which is one of the subchannels is 0x0010, and the information that PMT ID of program ** which is another subchannel is 0x0011 is stored. Here, when receiving the subchannel of program **, according to the information on the above-mentioned PAT 110, an ID number reads the data stored in PMT 111a which is 0x0010. Image data ID of program ** is 0x0001, and the information that same sound voice data ID is 0x000a is stored in PMT 111a. According to this information on PMT 111a, the video decoder 6c reads one by one what the ID number of [0x0001] image data 113 was given, The voice response circuit 9 reads one by one what the ID number of 0x000a was given among voice data 112, and decodes the video signal and audio signal of a subchannel of program **, respectively. Thus, PAT 110 is always contained in MPEG-2 data, in order to extract a video signal and an audio signal from a broadcasting signal.

[0023]The control section 8 can acquire PMT ID respectively corresponding to all the subchannels currently broadcast within the physical channel to receive by analyzing the information stored in PAT 110 of MPEG-2 data. The control section 8 assigns the virtual subchannel number on expedient according to the turn of PMT ID respectively corresponding to each subchannel. Since the subchannel number after [expedient] doing in this way and assigning turns into a number which follows in order of PMT ID, the virtual subchannel number which the broadcasting station set up arbitrarily is not necessarily a match.

[0024]Drawing 4 shows an example of the channel map which displays the information about the virtual channel number after [expedient] analyzing MPEG-2 data as mentioned above and acquiring about a physical channel "2." Since the main channel number of imagination here of a physical channel "2" was not able to acquire PSIP, it has given the "2" as a physical channel. [same as a number on expedient] And "1" and "2" which are the virtual subchannel numbers after [expedient] assigning like the above are given to a virtual subchannel number. Since the virtual subchannel number on [this] expedient is assigning the program number of PAT 110, it comprises a continuous number. It usually passes in a physical channel "5", and the main channel number "15" and virtual subchannel number (1, and "15, 30") of imagination which analyzed and acquired PSIP are displayed on it. A broadcasting station can set up this virtual subchannel number arbitrarily, and it may have a discontinuous number like this example. In this channel map, a translucent OSD display is performed and the underline is further attached so that the original virtual channel number acquired by analyzing a virtual channel number and PSIP after [expedient] being obtained by analyzing PAT 110 of MPEG-2 data can be distinguished easily.

[0025]Drawing 5 shows the screen which was added to the image and carried out the OSD display to the display device 12 about the virtual channel "2-1" (a main channel is "2" and a subchannel is "1") after [expedient] acquiring from PAT of MPEG-2 data. In drawing 5 (a), the notification message of the purport "which was not able to discover PSIP" is written in addition. In drawing 5 (b), it is indicating that it is not the usual virtual channel number by indicating the virtual channel number "2-1" on expedient by blink. By drawing 5 (c), by performing a translucent OSD display for the virtual channel number "2-1" on expedient shows that it is not the usual virtual channel number.

[0026]Thus, according to this STB1, even if it is a case where PSIP is unacquirable, the OSD display of the virtual channel number on expedient can be acquired and carried out by analyzing PAT 110 always contained in MPEG-2 data. The user can judge that easily by performing an OSD display with a different form from usual [of the purport that the virtual channel number

which acquired the virtual channel number after / expedient / acquiring in this way from PSIP is differed from].

[0027]Various modification is possible for this invention, without being restricted to the composition of the above-mentioned embodiment, for example, the virtual channel number on expedient may carry out the same OSD display, without distinguishing from the usual virtual channel number. STB1 is good also as composition which can also receive the analog broadcasting signal of NTSC in addition to the digital broadcasting signal of ATSC. In this case, the tuner 2 should also have the broadcasting signal of a zone with which analog broadcasting is distributed received, and it should have STB1 separately in the analog decoder which decodes the analog broadcasting signal which the tuner 2 received. The display of the virtual channel on expedient may be displayed on display devices, such as a liquid crystal display provided separately, further again, without being restricted to an OSD display.

[0028]

[Effect of the Invention]In [according to invention of Claim 1 as mentioned above] digital one / analog broadcasting receiving set, Even if it is a case where PSIP is unacquirable, the OSD display of the virtual channel number on expedient can be acquired and carried out by analyzing PAT and PMT which are one of the PSI(s) contained in the information packet of MPEG-2. Therefore, the user can check the virtual channel number of the himself selected channel on a display screen, and can choose a channel now easily.Since the OSD display of a different form is made, the user can distinguish both from the virtual channel number which the virtual channel number after [expedient] analyzing and acquiring PAT and PMT analyzed PSIP, and was acquired easily.

[0029]According to invention of Claim 2, in a digital broadcasting receiving set, even if it is a case where PSIP is unacquirable, the OSD display of the virtual channel number on expedient can be acquired and carried out by analyzing PSI contained in the information packet of MPEG-2. Therefore, the user can check the virtual channel number of the himself selected channel on a display screen, and can choose a channel now easily.

[0030]Since according to invention of Claim 3 it is analyzed and the OSD display of the virtual channel number is acquired and carried out in a digital broadcasting receiving set when PSIP is acquired, the user can know the virtual channel number which the broadcasting station set up arbitrarily.

[Translation done.]

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TECHNICAL FIELD

[Field of the Invention]This invention relates to the digital broadcasting receiving set which has a receiving channel number display function which carries out an OSD display for the virtual channel number which starts a broadcast receiving set, especially is received to a displaying means.

[Translation done.]

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PRIOR ART

[Description of the Prior Art]Conventionally, in cable digital broadcasting etc., the 64QAM modulator is known as a modulator used when sending the image and audio signal which carried out compression encoding by MPEG-2 standard via a CATV transmission line (for example, refer to JP,2000-197020,A). This enables specification of whether the obstacle occurred with which 64QAM modulator from the displayed above-mentioned channel number, when a channel number is displayed on users' (addressee) broadcast receiving set and an obstacle occurs during broadcast reception. This modulator is used in the case of the broadcasting station side's dispatch of a broadcasting signal. Only the channel to which it can view and listen is outputted to a display screen, and the digital broadcasting receiving set which made a user's channel selection operation easy is known (for example, refer to JP,H10-200868,A).
[0003]By the way, in North America, the digital broadcasting based on ATSC (Advanced Television Systems Committee) from a broadcasting station is distributed in recent years. This digital broadcasting is received, The broadcast receiving set (set top box: describe it as STB below) for changing into the signal which the television receiver of analog broadcasting correspondence of existing NTSC (National Television Systems Committee) can televise is spreading. It is possible to give the function indicated by this STB at JP,H10-200868,A.
[0004]The digital broadcasting signal is sent in the digital broadcasting of ATSC by different physical channel from an analog broadcasting signal. One physical channel 1 or two or more contents including the subchannel for sending to this subchannel. The virtual channel number which consists of the same number (main channel number) as a physical channel number and subchannel number of the analog broadcasting sent from the broadcasting station of a same or same system is given. Therefore, the virtual channel is constituted by the main channel and the subchannel hierarchical.
[0005]The broadcasting signal of digital broadcasting consists of a video signal, an audio signal, and a control signal, and in the digital broadcasting of ATSC. A duty is imposed so that PSIP (Program and System Information Protocol) included the information about a virtual channel number or a broadcasting station name may be attached to the above-mentioned control signal and it may be sent to it. The control section of STB can specify the virtual channel number to receive by referring to VCT (Virtual Channel Table) obtained by acquiring and analyzing this PSIP. In digital broadcasting, as already stated, each channel is constituted by the main channel number and the subchannel number hierarchical, and since the composition is complicated, the user may be unable to understand composition of the channel which oneself chose. Then, STB carries out the OSD display of the virtual channel number which specified [above-mentioned] to a display device, and is aiming at improvement in a user's user-friendliness.

[Translation done.]

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EFFECT OF THE INVENTION

[Effect of the Invention]In [according to invention of Claim 1 as mentioned above] digital one / analog broadcasting receiving set, Even if it is a case where PSIP is unacquirable, the OSD display of the virtual channel number on expedient can be acquired and carried out by analyzing PAT and PMT which are one of the PSI(s) contained in the information packet of MPEG-2. Therefore, the user can check the virtual channel number of the himself selected channel on a display screen, and can choose a channel now easily.Since the OSD display of a different form is made, the user can distinguish both from the virtual channel number which the virtual channel number after [expedient] analyzing and acquiring PAT and PMT analyzed PSIP, and was acquired easily.
[0029]According to invention of Claim 2, in a digital broadcasting receiving set, even if it is a case where PSIP is unacquirable, the OSD display of the virtual channel number on expedient can be acquired and carried out by analyzing PSI contained in the information packet of MPEG-2. Therefore, the user can check the virtual channel number of the himself selected channel on a display screen, and can choose a channel now easily.
[0030]In invention of Claim 3, in a digital broadcasting receiving set, when PSIP is acquired, it is analyzed, and the OSD display of the virtual channel number is acquired and carried out. Therefore, the user can know the virtual channel number which the broadcasting station set up arbitrarily.

[Translation done.]

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TECHNICAL PROBLEM

[Problem to be solved by the invention]However, PSIP cannot be acquired, when the office which is sending the digital broadcasting signal without attaching PSIP as a control signal depending on a broadcasting station also exists and the channel of such a broadcasting station is received. Even if a broadcasting station attaches PSIP and is sending the broadcasting signal, acquisition of PSIP may go wrong according to a certain situation of inaccurate PSIP data having been added, for example to the signal of PSIP. Thus, when PSIP is unacquirable, even if possible, since it is unknown, acquiring a video signal and receiving a picture cannot perform the OSD display, and a user's user-friendliness is not good [a thing / the virtual channel number].
[0007]This invention is made in order to solve the problem mentioned above, and it is a thing. Also in the case where the purpose is not able to acquire PSIP contained in a broadcasting signal in a receiving set, By displaying the channel number on expedient, it is providing the broadcast receiving set which has a display function of the receiving channel number which aimed at improvement in user-friendliness for the channel change as an easy thing for a user.

[Translation done.]

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MEANS

[Means for solving problem]To achieve the above objects, invention of Claim 1, The input means for inputting channel change instructions into a device main frame, You make it based on the standard of ATSC (Advanced Television Systems Committee) from a broadcasting station, and it is PSIP (Program.) to the information packet of MPEG(Moving Picture Experts Group)-2. The reception means which receives digital one / analog broadcasting signal sent after adding the information packet of and System Information Protocol, A signal extraction means to extract a video signal, an audio signal, and a control signal from the digital broadcasting signal received by the reception means, The video signal contained in the video signal or analog broadcasting signal extracted by the signal extraction means is decoded, Digital one / analog decoding means outputted to the displaying means which displays the image with which the decoded signal was connected to this equipment, It has a memory measure which memorizes the control signal extracted by the signal extraction means, an OSD output means which gives a predetermined onscreen display (it is hereafter described as OSD) indication to a displaying means, and a control means which controls each means of the above-mentioned equipment, In the broadcast receiving set which has a receiving channel number display function which carries out the OSD display of the receiving channel number from a displaying means, From the broadcasting station of a same or same system, a digital broadcasting signal and an analog broadcasting signal are sent by mutually different physical channel, and a digital broadcasting signal, The subchannel for being sent for every physical channel and sending 1 per physical channel or two or more contents is included, And the virtual channel number which consists of the same number as a physical channel number and subchannel number of analog broadcasting is given to this subchannel, and a control means, By acquiring the information packet of PSIP out of the control signal which the signal extraction means extracted, and referring to VCT (Virtual Channel Table) produced by analyzing it, When the virtual channel number to receive is specified, the OSD display of this virtual channel number is performed and PSIP is not able to be acquired out of a control signal, the information packet of MPEG-2 is acquired, The virtual subchannel number on expedient is assigned to each subchannel according to the turn of each subchannel of having analyzed and detected PAT (Program Association Table) and PMT (Program Map Table) which are contained in it, The virtual channel number which specified the channel number which consists of a physical channel number and a virtual subchannel number on expedient by analyzing VCT as a virtual channel number on expedient performs the OSD display of a different form.
[0009]In this composition, a digital broadcasting signal is sent from a broadcasting station including a video signal, an audio signal, and a control signal by the packet-ized data (MPEG-2 data) in which animation compression was carried out by MPEG-2 standard. The information packet of PSIP which has the information about the virtual channel for receiving ATSC broadcast is added to a control signal. PSI (Program Specific Information) etc. which have the information about the composition of a program are contained in the information packet of MPEG-2. In ATSC, a duty is imposed so that PSIP may be attached to a digital broadcasting signal and may be sent, but being sent where this is not necessarily attached depending on a broadcasting station is not restricted. On the other hand, since PSI is information required in

order to extract a video signal and an audio signal, it is sent in the state where it was always attached as an information packet in MPEG-2. When PSIP contained in a broadcasting signal is acquired, by referring to VCT produced by analyzing it, a control means specifies the virtual channel number to receive, and carries out the OSD display of the virtual channel number. When PSIP is not contained in a broadcasting signal and PSIP cannot be acquired according to a certain situation, PSI contained in MPEG-2 data is analyzed, the configuration information on a subchannel is acquired, and the subchannel number on expedient is assigned. In this composition, PAT and PMT which are one of the PSI(s) are analyzed, and the virtual subchannel number on expedient is assigned to each subchannel. A physical channel number and the virtual subchannel number on [this] expedient give the virtual channel number on expedient for an OSD display. Assigning the virtual subchannel number after [expedient] being obtained by analyzing PSI contained in this MPEG-2 data according to the turn of the program of PMT, the original subchannel number which a broadcasting station can set up arbitrarily is not necessarily a match. Then, a user distinguishes and does the OSD display of each with a different form so that the virtual channel number after [expedient] being obtained by analyzing MPEG-2 data, and the original virtual channel number acquired by analyzing PSIP can be distinguished. Distinction of this OSD display may be repealed by a user's request. In this case, the virtual channel number on expedient is outputted as the same OSD display as the usual virtual channel number.

[0010]An input means for invention of Claim 2 to input channel change instructions into a device main frame, You make it based on the standard of ATSC (Advanced Television Systems Committee) from a broadcasting station, and it is PSIP (Program.) to the information packet of MPEG(Moving Picture Experts Group)-2. The reception means which receives the digital broadcasting signal sent after adding the information packet of and System Information Protocol, A signal extraction means to extract a video signal, an audio signal, and a control signal from the digital broadcasting signal received by the reception means, The video signal contained in the video signal or analog broadcasting signal extracted by the signal extraction means is decoded, The digital decoding means outputted to the displaying means which displays the image with which the decoded signal was connected to this equipment, It has a memory measure which memorizes the control signal extracted by the signal extraction means, an OSD output means which gives a predetermined onscreen display (it is hereafter described as OSD) indication to a displaying means, and a control means which controls each means of the above-mentioned equipment, In the broadcast receiving set which has a receiving channel number display function which carries out the OSD display of the receiving channel number from a displaying means, From the broadcasting station of a same or same system, a digital broadcasting signal and an analog broadcasting signal are sent by mutually different physical channel, and a digital broadcasting signal, The subchannel for being sent for every physical channel and sending 1 per physical channel or two or more contents is included, And the virtual channel number which consists of the physical channel number, the same number, and subchannel number of analog broadcasting is given to this subchannel, and a control means, Acquire the information packet of MPEG-2 out of a control signal, and the virtual subchannel number on expedient is assigned to each subchannel according to the turn of each subchannel of having analyzed and detected PSI (ProgramSpecific Information) contained in it, An OSD display is performed for the channel number which consists of a physical channel number and a virtual subchannel number on expedient as a virtual channel number on expedient.

[0011]In this composition, a broadcasting signal is sent from a broadcasting station like Claim 1 by MPEG-2 packet-ized data in which animation compression was carried out by MPEG-2 standard. An information packet of PSIP which has the information about a virtual channel as a control signal is added. PSI etc. which have the information about composition of a program are included in MPEG-2 data. A control means analyzes PSI contained in MPEG-2 data, and assigns a subchannel number on expedient. That is, PSI is assigned as a virtual subchannel number on expedient according to turn of each subchannel analyzed and detected. By physical channel number and a virtual subchannel number on [this] expedient, a virtual channel number on expedient for an OSD display is given, and the OSD display of this is carried out.

[0012]Invention of Claim 3 the receiving channel number display function according to claim 2 in

a broadcast receiving set which it has a control means, When PSIP (Program and System Information Protocol) contained in a control signal which a signal extraction means extracted is acquired, By referring to VCT (Virtual Channel Table) produced by analyzing this PSIP, a virtual channel number to receive is specified and the OSD display of this virtual channel number is carried out. In this composition, when PSIP is acquired, by analyzing this PSIP, a broadcasting station acquires a virtual channel number set up arbitrarily, and carries out the OSD display of this.

[0013]

[Mode for carrying out the invention]The digital broadcasting receiving set (set top box: describe it as STB below) hereafter applied to one embodiment which materialized this invention is explained with reference to Drawings. Drawing 1 shows the block configuration of STB. STB1 is the input devices 11, such as a body button or a remote control.

[Translation done.]

* NOTICES *

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2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1]The block block diagram of the digital broadcasting receiving set by one embodiment of this invention.
[Drawing 2]The block block diagram of TS analysis circuit of the equipment.
[Drawing 3]The figure showing MPEG-2 data which the equipment analyzes
[Drawing 4]The figure showing the channel map which displays the virtual channel number after [expedient] being obtained by analyzing the data.
[Drawing 5]The figure showing the display example of a virtual channel number when [expedient] a screen display is carried out by the equipment.
[Explanations of letters or numerals]
1 STB (broadcast receiving set)
2 Tuner (reception means)
6a Transport purser (signal extraction means)
6c Video decoder (digital decoding means)
6e OSD circuit (OSD output means)
7 Memory (memory measure)
8 Control section (control means)
11 Input device (input means)
12 Display device (displaying means)
110 PAT
111a, 111b PMT

[Translation done.]

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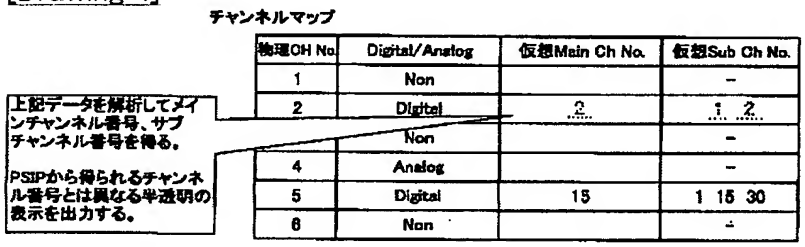
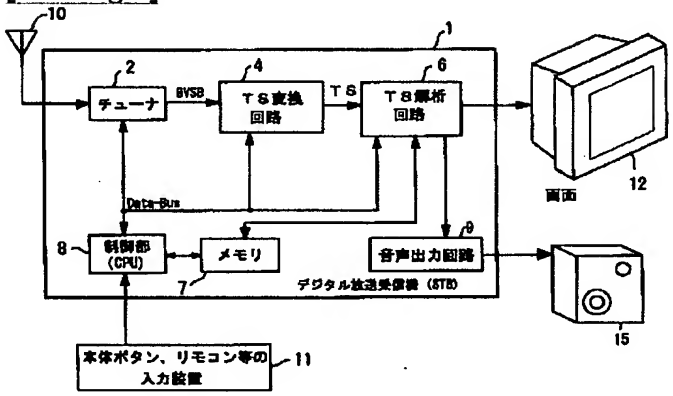
DRAWINGS

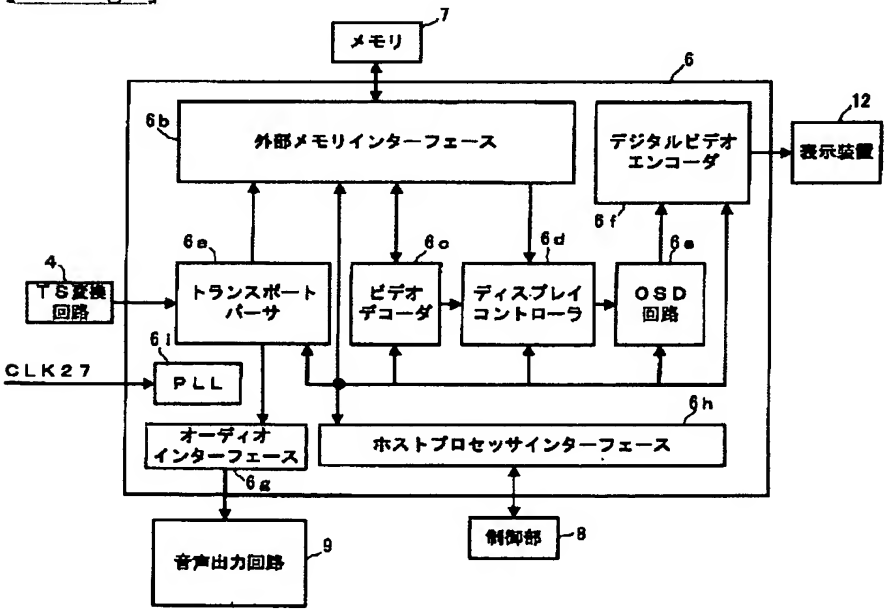
[Drawing 4]



[Drawing 1]

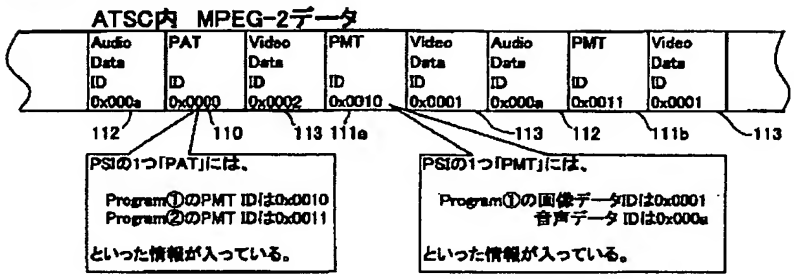


[Drawing 2]



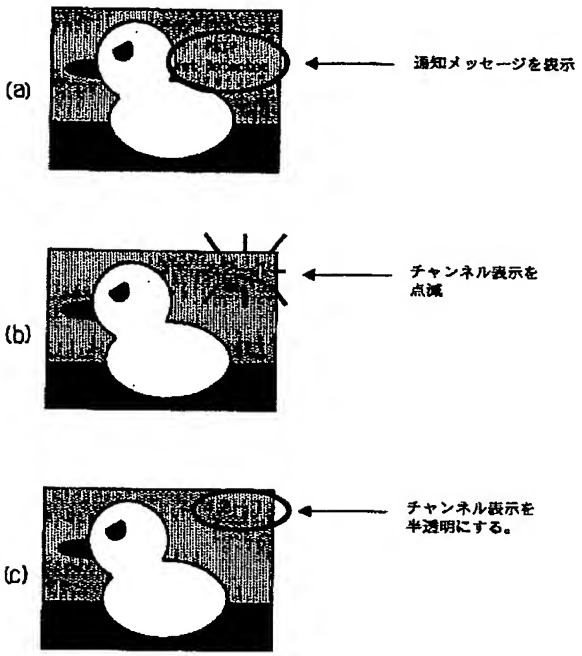
[Drawing 3]

米国ATSCの2chで、PSIPを含んでいない場合



[Drawing 5]

テレビ画面



[Translation done.]